ANLAGE VII

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Datum: 29. Mai 1998 12:58
Empfänger: ETA-Optik <ETA-Optik@t-online.de>
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Betreff: Re: Samples 980224/225/414 for ETA-Optik: Measurement Result

Dear Mr. Hertling,

Thank you for your extensive data. I have not analysed your data in detail. Jeroen Bouwens will do the analyses in due time.

My first reaction on your general remarks:

ad 1.
I am very glad that thickness fit with known optical constants gives single solutions. We agree that determining opt const is difficult.

Indeed thicker layers makes it easier. But the layer thickness should be not too far away from the real working point, because probably the material constants will be somewhat dependent on the thickness (boundery effects etc).

ad 2.
Is it anyway possible to fit both opt const and ticknesses simutanously. Too many variables?

ad 3.
Indeed IP stack changes over time. It is not realy usefull.

ad 5.
We will look at the neasurement differences. One reason may be the strong thickness variation over the circonference of the samples you obtained. For the determination we averaged the reflection over a whole revolution.

Further:
* Good to hear the (thick) samples are usufull for you. Don't you have problems with the large variation over the circonference?
* What kind of RT-tester did you use for the supplied measurements?

I am looking forward to further discussion,
best regards,
Igolt Ubbens

Reply Separator
Subject: Samples 980224/225/414 for ETA-Optik: Measurement Results
Author: ETA-Optik@t-online.de at #SMTP
Date: 27/05/98 01:23

Dear Mr Ubbens,

on our last meeting at ODTC we discussed the principle evaluation of samples for material data determination. Hereby we now send you the detailed results for your samples 980224(01-07), 980225(01-04) and 980414(01-06) as zipped files. There are five types of data included in these files:

a) *.nk : Material data as function of wavelength
b) *.oc2 : Olectra Chart format which contain the whole graphics (windows and spectra) from the ETA-RT-measurement-system. This format can be loaded after starting "ETA-RT" ("load"-Menu). Afterwards one can extract the measurement (*.spk) from this grapics.
c) *.bmp : Some of our measurements/fits as pictures
d) *.spk : Some examples of Reflection or Transmission Spectra
e) *.cfg : The fit configuration file which is written in the format of our version 1.00 of "ETA-RT" which will be installed on your system at our next meeting.

Some general results or problems can be listed as follows:

1) The thickness fit of a whole CDRW-Stack for given material data leads to a single solution very easily and fast. More difficult is a determination of material data, especially in case of thin layers. The use of samples with layers of higher thickness is recommended.
2) To obtain good results for the material fit procedure, one must fit the thicknesses of all layers simultaneously with the material parameters. For thin layers the exclusion of ambiguities is difficult.
3) The open Phase Change layer changes properties in time. The reflectance and transmittance of this layer (on top of a buffer layer; samples 224-04 and 225-02) could only be fitted immediately after preparation.
4) Many short fit sessions are better than one long session. The new version of the program takes care of this. Moreover, data file fit, instead of fit from an actual measurement, and two or three layer stack material fit is possible: The unknown layer is on top of already determined layers.
5) There were some deviations of our thickness results from your tables.

   Generally, the buffer layer values of samples 224-xx and 225-xx were lower, and of samples 414-xx higher than expected.

In detail, we obtained the following thicknesses

Charge	Sample	Thickness [nm]	Material
980224	01	43.8	I1
	02	55.7	I1
	03	85.4	I1

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          04          80.3              I1
                     28.2              P-a (SDS 13)
     ----------------------------------------------------------------
          05          76.4              I1
                     29.4              P-a (SDS 13)
                     20.9              I2
     ----------------------------------------------------------------
          08          59.6              I1
================================================================================
980225          01          86.6              I1
     ----------------------------------------------------------------
          02          82.8              I1
                     22.5              P-a (SDS 56)
     ----------------------------------------------------------------
          03          76.4              I1
                     30.0              P-a (SDS 56)
                     21.0              I2
     ----------------------------------------------------------------
          04          87.4              I1
                     23.1              P-a (SDS 56)
                     21.6              I2
                     (100)              M      (Al)
================================================================================
================================================================================
980414          01          188.9              I
          02          220.3              I
          03          240.9              I
          04          288.7              I
          05           50.8              I
          06           95.0              I

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Perhaps we can discuss all this on our next meeting. Your samples and remarks were very, very helpfull to us, to improve our soft- and hardware and to avoid some mistakes. I hope that our data you have been waiting for can be usefull for your work.

With kind regards,
ETA-Optik,
Rolf Hertling

Schichtdicken

22.07.92

Energy	Sample	Thickness of layer [nm]	Type of Material	
80 224	01	43.8	I1	
	02	55.7	I1	
	03	85.4	I1	
	04	80.3	I1	
		28.2	P-a	(SDS 13)
	05	76.4	I1	
		29.4	P-a	(SDS 12)
		20.9	I2	
	08	59.6	I1	
80225	01	86.6	I1	
	02	82.8	I1	phase. cfg
		22.5	P-a	(SDS 56)
	03	76.4	I1	Sutfw 2.cfg
		30.0	P-a	(SDS 56)
		21.0	I2	
	04	87.4	I1	stack. cfg
		23.1	P-a	(SDS 56)
		21.6	I2	
		100.0	M (Al)	
380 414	01	188.9	I	Sutfw1.cfg
	02	220.3	I	
	03	240.9	I	
	04	288.7	I	
	05	50.8	I	
	06	95.0	I	